Date: Thursday, 02/10/2008 10:34:38 AM
User: Julie Lecocq

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	**Drawing Name**	: BLADE FITTING
Job Number	: 42415		
Estimate Number	: 12300		
P.O. Number	:	**Part Number**	: D3488042
This Issue	: 02/10/2008 **S.O. No.** :	**Drawing Number**	: D3488 / DSK101
Prsht Rev.	: NC	**Project Number**	: N/A
First Issue	: / / **Type** : MACHINED PARTS	**Drawing Revision**	: B / D
Previous Run	: 41206	**Material**	:
Written By	:	**Due Date**	: 10/10/2008 **Qty:** 20 **Um:** Each
Checked & Approved By	: JLD 08.10.02		
Comment	: Est Rev:A New Issue 06-02-28 JLM		
	Est Rev:B As per Rev B 06-03-30 JLM		
	Est Rev:C Now On Doosan Lathe JLM Verified BY:DD		

Additional Product

Job Number:

Seq. #:	Machine Or Operation:	Description :
1.0	D6103003	Round Billet, Aluminum

Comment: Qty.: 1.0000 Each(s)/Unit Total : 20.0000 Each(s) B41609X 4pcs
Alluminum Round Billet D6103-003
Batch: B41965 X 16 pcs J.F. 08/10/10 (20)

2.0	DOOSAN LATHE	DOOSAN LATHE (PH)

Comment: DOOSAN CNC LATHE
1-Turn as per Dwg DSK 101 & Folio FA627
2-Deburr J.F. 08/10/10 (20)

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE

Comment: INSPECT PARTS AS THEY COME OFF MACHINE J.F. 08/10/10 (20)

4.0	HAAS1	HAAS CNC VERTICAL MACHINING #1

Comment: HAAS CNC VERTICAL MACHINING #1
1-Machine as per Folio FA627 & Dwg D3488
2-Deburr J.L 08/10/10 (20)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3488-042 PAR #: _____ Fault Category: _____ NCR: Yes (No) DQA: [illegible] Date: 08/10/22

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: 42415		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B: Initial Chief Eng	Action Description Chief Eng	Sign & Date	Verification Section C	Approval Chief Eng	Approval QC Inspector
8/10/9	#20	During machining it was found that chatter was on inside of Bore. During removal of the chatter the 2.150" Bore was machined to 2.175" .025 over normal. RC chatter on inside from Boring	RH QSI 042 08.10.09	Acceptable deviation - see attached analysis	RH ~~DT~~ QSI 042 08.10.09 JF. 08/10/09	08/10/09	RH QSI 042 08.10.09	08/10/09

NOTE: Date & initial all entries

Date: Thursday, 02/10/2008 10:34:38 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services **Drawing Name:** BLADE FITTING

Job Number: 42415 **Part Number:** D3488042

Job Number:

Seq. #:	Machine Or Operation:	Description :	
5.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE	
	Comment: INSPECT PARTS AS THEY COME OFF MACHINE		J.L 08/10/18
6.0	QC8	SECOND CHECK	
	Comment: SECOND CHECK		SP 08/10/18 (20)
7.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	(20X)
	Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1		M-L 08/10/20
8.0	POWDER COATING	POWDER COATING	(20X)
	M109152		
	Comment: POWDER COATING Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3 START TIME: 11:25 OVEN TEMPERATURE: 320°F FINISH TIME: 11:55		M-L 08/10/20
9.0	QC3	INSPECT POWDER COAT/CHEMICAL CONVERSION	(20)
	Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION		FL 08/10/20
10.0	ALS71032225	INSERT	
	Comment: Qty.: 4.0000 Each(s)/Unit Total : 80.0000 Each(s) Pick: Qty Part Number Description Batch 4 ALS7-1032-225 Insert M/00621		FL
11.0	HAND FINISHING1	HAND FINISHING RESOURCE #1	(20)
	Comment: HAND FINISHING RESOURCE #1 Install Inserts as per Dwg D3488		FL 08/10/20

Form: rprocess

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

Date: Thursday, 02/10/2008 10:34:39 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services **Drawing Name:** BLADE FITTING

Job Number: 42415 **Part Number:** D3488042

Job Number:

Seq. #:	Machine Or Operation:	Description :
12.0	QC5	INSPECT WORK TO CURRENT STEP

Comment: INSPECT WORK TO CURRENT STEP

counter
08/10/20 (20)

13.0	PACKAGING 1	PACKAGING RESOURCE #1

Comment: PACKAGING RESOURCE #1
Identify and Stock
Location: FP-8

FZ 08/10/20 (20)

14.0	QC21	FINAL INSPECTION/W/O RELEASE

Comment: FINAL INSPECTION/W/O RELEASE

08/10/21

Job Completion

MF 08-10-20

Form: rprocess

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	**STEP**	**PROCEDURE CHANGE**	**By**	**Date**	**Qty**	**Approval** Chief Eng / Prod Mgr	**Approval** QC Inspector

Part No: _____ **PAR #:** _____ **Fault Category:** _____ **NCR:** Yes No **DQA:** _____ **Date:** _____

Resolution: _____ **Disposition:** _____ **QA: N/C Closed:** _____ **Date:** _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	**STEP**	**Description of NC** Section A	**Corrective Action** Section B			**Verification** Section C	**Approval** Chief Eng	**Approval** QC Inspector
			Initial Chief Eng	**Action Description** Chief Eng	**Sign & Date**			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	42415
Description: Blade Fitting, RH	Part Number:	D3488-2
Inspection Dwg: D3488 **Rev:** B		Page 1 of 1

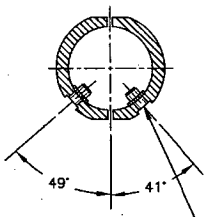
FIRST ARTICLE INSPECTION CHECKLIST

[X] First Article [ ] Prototype

Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
0.125	+/-0.010	.131"	✓			
2.620	+/-0.010	2.617"	✓			
0.793	+/-0.010	.803	✓			
1.351	+/-0.010	1.348	✓			
1.317	+/-0.010	1.311	✓			
90°	+/-0.1°	90°	✓			
1.802	+/-0.010	1.812	✓			
Ø0.508	+0.006/-0.001	.508	✓			
R0.062	+/-0.010	.062	✓			
1.500	+/-0.010	1.498	✓			
8.000	+0.030/-0.000	8.003"	✓			
11.18	+/-0.030	11.180	✓			
Ø0.484	+0.005/-0.001	Ø.486"	✓			
1.180	+/-0.010	1.181"	✓			
3.150	+/-0.010	3.152"	✓			
3.070	+/-0.010	3.067"	✓			
0.590	+/-0.010	.591	✓			
0.125	+/-0.010	.130	✓			
1.005	+/-0.010	1.005"	✓			
3.500	+/-0.010	3.500"	✓			
Ø0.297	+0.005/-0.000	Ø.301"	✓			
Ø0.430	+/-0.010	Ø.432"	✓			
0.100	+/-0.010	.102"	✓			

Measured by:	J.F./J.L	Audited by:	SB	Prototype Approval:	N/A
Date:	08/10/10	Date:	08/10/19	Date:	N/A

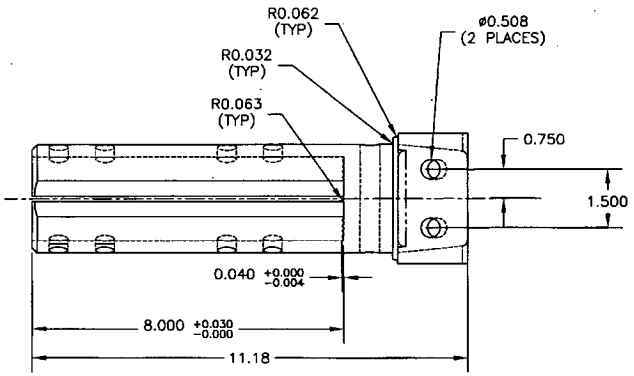
Rev	Date	Change	Revised by	Approved
A	06.03.31	New Issue	KJ/JLM	

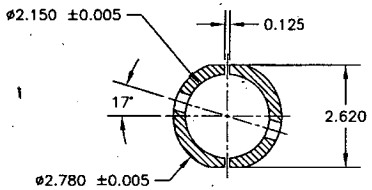


SECTION B–B

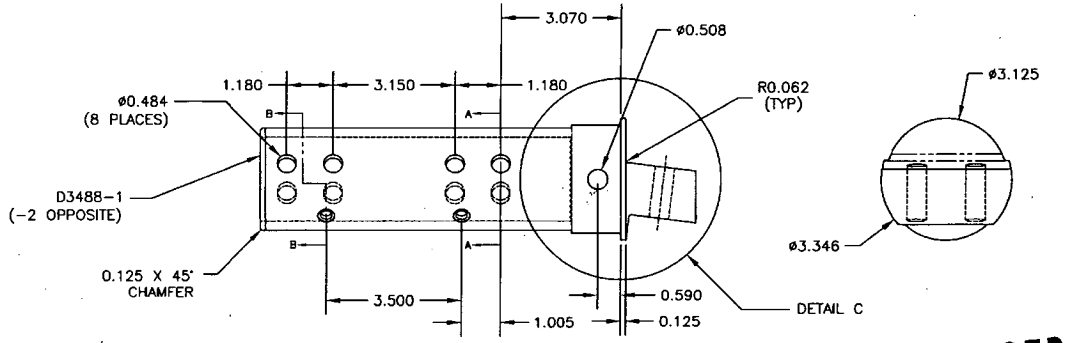
ø0.297
C'BORE ø0.430 x 0.100
INSTALL ALS4–1032–225 (OR AKS4–1032–225
OR ALS7–1032–225 OR AKS7–1032–225)
INSERTS AFTER FINISH
(4 PLACES)

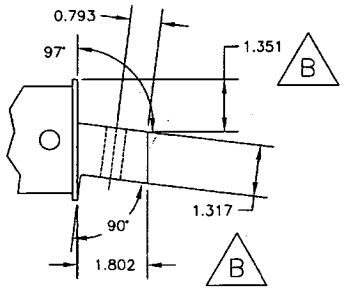
4





SECTION A–A





DETAIL C

D3488–041 SHOWN (D3488–042 OPPOSITE)

RELEASED
06.03.15 PH
PER DS
ECN #737

D3488–041/–042 BLADE FITTING ASSEMBLY PARTS LIST

QTY -041	QTY -042	PART NUMBER	DESCRIPTION
X		D3488-041	BLADE FITTING ASSEMBLY (LH)
	X	D3488-042	BLADE FITTING ASSEMBLY (RH)
1		D3488-1	BLADE FITTING (LH)
	1	D3488-2	BLADE FITTING (RH)
4	4	ALS4-1032-225 or AKS4-1032-225 or ALS7-1032-225 or AKS7-1032-225	INSERT

D3488–041/–042 BLADE FITTING

1) MATERIAL: MAKE D3488–1/–2 FROM ALUMINUM 7075–T7351 ROUND BAR PER QQ–A–225/9 (REF. DART MATERIAL SPEC M7075T73R)
2) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1
POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.1
3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
4) INSTALL INSERTS AFTER POWDER COAT
5) ALL DIMENSIONS ARE IN INCHES
6) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 42415

B	06.03.15	CHANGE THICKNESS
A	05.12.20	NEW ISSUE

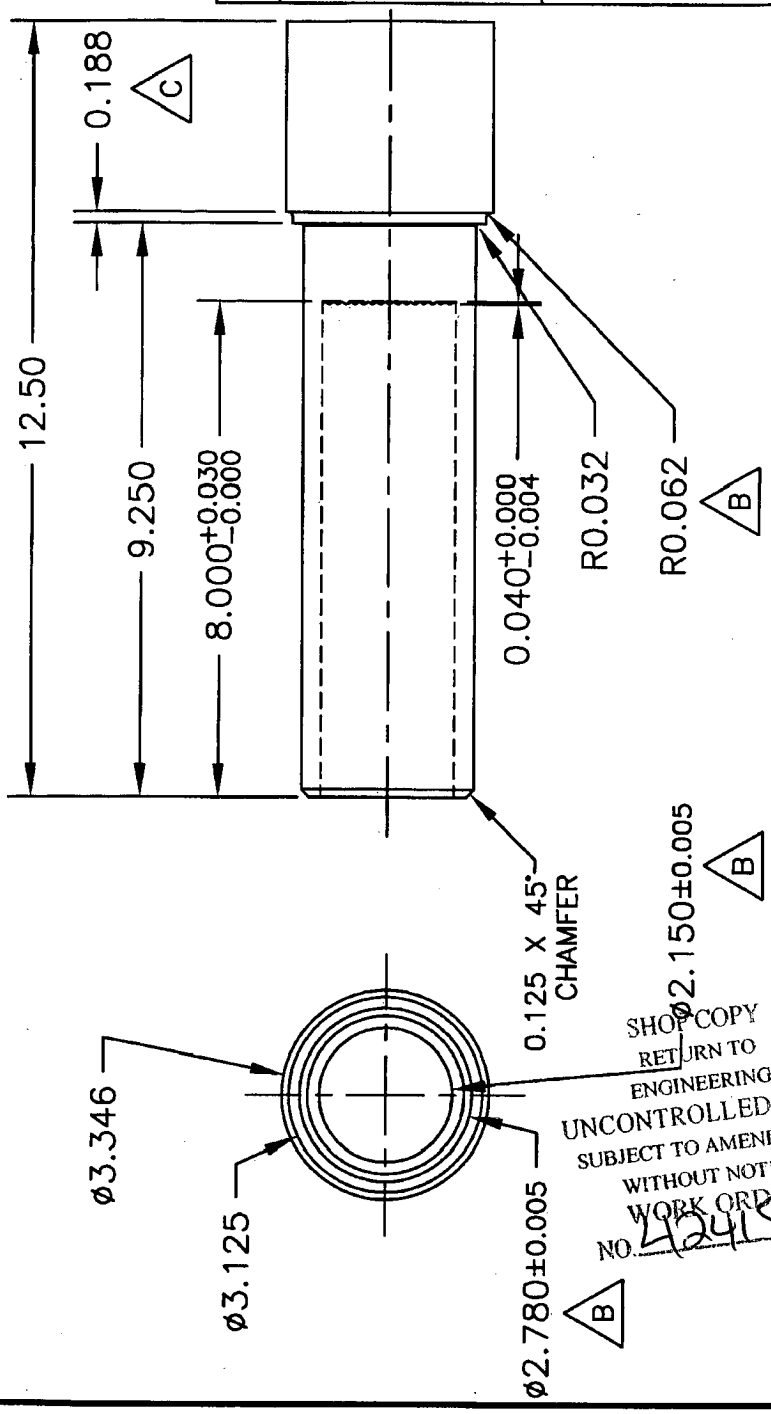
DESIGN PH	DRAWN BY PH	DART AEROSPACE USA, INC. PORT HADLOCK, WA	
CHECKED	APPROVED	DRAWING NO. D3488	REV. B
DATE 06.03.15		TITLE BLADE FITTING	SCALE 1:3

SHEET 1 OF 1

DESIGN	DRAWN BY	DART AEROSPACE USA, INC.
PH	PH	PORT HADLOCK, WA
CHECKED	APPROVED	DRAWING NO. / REV.
		DSK 101 / REV. D
DATE		TITLE / SCALE
06.05.09		D3488-1/-2 TURNING DETAIL / 1:3

A	05.12.21	NEW ISSUE
B	06.03.02	ADD TOLERANCES AND RADIUS
C	06.04.17	0.188 WAS 0.125
D	06.05.09	REMOVE DIAMETER FOR CHAMFER

SHOP COPY
06.05.09



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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 42415

DSK 101

1) MATERIAL: MAKE FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9 (REF. DART MATERIAL SPEC M7075T73R)
2) FINISH: NONE
3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
4) ALL DIMENSIONS ARE IN INCHES
5) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

Deviation for D3488-042 B42415 pkt 08-10-09
ϕ 2.175 instead of ϕ 2.150

For installation of the Apical Tri-bag and Apical Cylindrical Float bag systems onto OEM skidtubes; it is required that the OEM P/N 350A41-1077-24/-25 blade fitting be substituted with the Apical P/N 20473-7/-8 blade fitting. In the proposed Dart skidtube configuration, the Dart D3488-041/-042 blade fitting will replace the Apical P/N 20473-7/-8 blade fitting.

In the Dart system, blade fitting D3488-041/-042 will be used to transfer load into the web of the skidtube assembly. On the outside of the skidtube, D3488-041/-042 is dimensionally identical to the Apical P/N 20473-7/-8 blade fitting and is manufactured from the same 7075-T7351 material. Therefore, the Dart blade fitting and the Apical blade fitting have identical structural capability. The longitudinal location of the holes on the D3488-041/-042 blade fitting used to mount the aft crosstube are identical to the Apical P/N 20473-7/-8 blade fitting. On the inside of the skidtube, D3488-041/-042 has been designed to withstand higher bending moments than the Apical fitting.

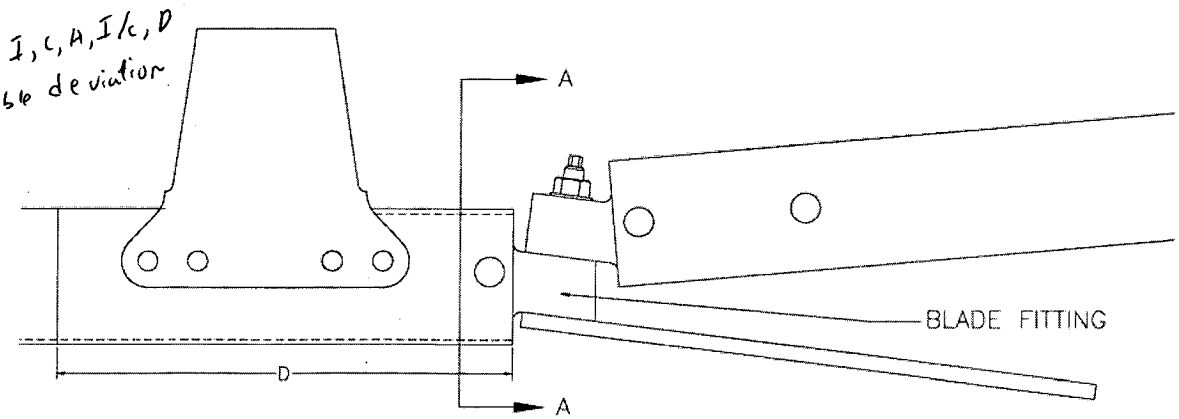
The following table compares the Dart D3488-041/-042 blade fitting to the Apical 20473-7/-8 blade fitting.

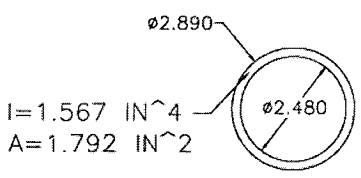
w/ Deviation

Component	**Dart D3488-041/-042**	**Apical P/N 20473-7/-8**
Material	7075-T7351 per QQ-A-225/9	7075-T7351 per QQ-A-225/9
(I) Moment of Inertia of portion inside skidtube	1.620 in^4 (from D3488-041/-042 dwg)	1.567 in^4 (from D20473-7/-8 dwg)
(C) Distance to outer fibers	1.310 in (from D3488-041/-042 dwg)	1.445 in (from 20473-7/-8 dwg)
(A) Area at section A-A	**2.280 in^2**	1.792 in^2
Z=I/C at section A-A	**1.234 in^3**	1.084 in^3
D	**10.69 in**	10.53 in

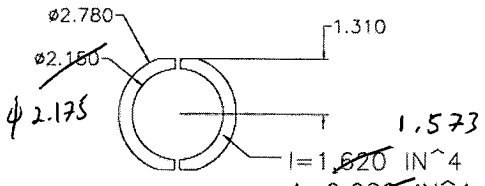
1.573
1.310
2.199
1.201
N/C
9

Dart is still greater I, c, A, I/c, D
∴ acceptable deviation





SECTION A–A
APICAL P/N
20473–7/–8
BLADE FITTING



SECTION A–A
DART P/N
D3488–041/–042
BLADE FITTING

W/ B42415